MORPHOMETRIC DATA

Watershed Area (Ac.):	1,250	Max. Depth (m):	6.4	Flushing Rate (yr¹)	1
Surface Area (Ac.):	192	Mean Depth (m):	2.8	P Retention Coef:	0.75
Shore Length (m):	3,500	Volume (m³):	2,204,000	Elevation (ft):	1106

TROPHIC CLASSIFICATION

Year	Trophic class
1990	MESOTROPHIC
2005	MESOTROPHIC

KNOWN EXOTIC SPECIES

The Waterbody Report Card tables are generated from the DRAFT 2014 305(b) report on the status of N.H. waters, and are based on data collected from 2004-2013. Detailed waterbody assessment and report card information can be found at www.des.nh.gov/organizations/divisions/water/wmb/swqa/index.htm

Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Good	The calculated median is from 5 or more samples and is < indicator and > 1/2 indicator and the chlorophyll a indicator is okay.
	pH	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	Oxygen, Dissolved	Good	There are at least 10 samples with one, but < 10% of samples, exceeding criteria.
	Dissolved oxygen satura	Good	There are at least 10 samples with one, but < 10% of samples, exceeding criteria.
	Chlorophyll-a	Good	The calculated median is from 5 or more samples and is < indicator and > 1/2 indicator.
Primary Contact Recreation	Escherichia coli	Good	There are geometric means and all geometric means are < geometric mean criteria; and there has been a single sample exceedance.
	Chlorophyll-a	Very Good	There are a total of at least 10 samples with 0 exceedances of indicator.

BEACH PRIMARY CONTACT ASSESSMENT STATUS

FOREST LAKE - FOREST LAKE STATE PARK	Escherichia coli	Very Good	Where there are no geometric means, all bacteria samples are < 75% of the geometric mean. Where there are geometric means all single bacteria samples are < the SSMC and all geometric means are < geometric mean criteria.

WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.
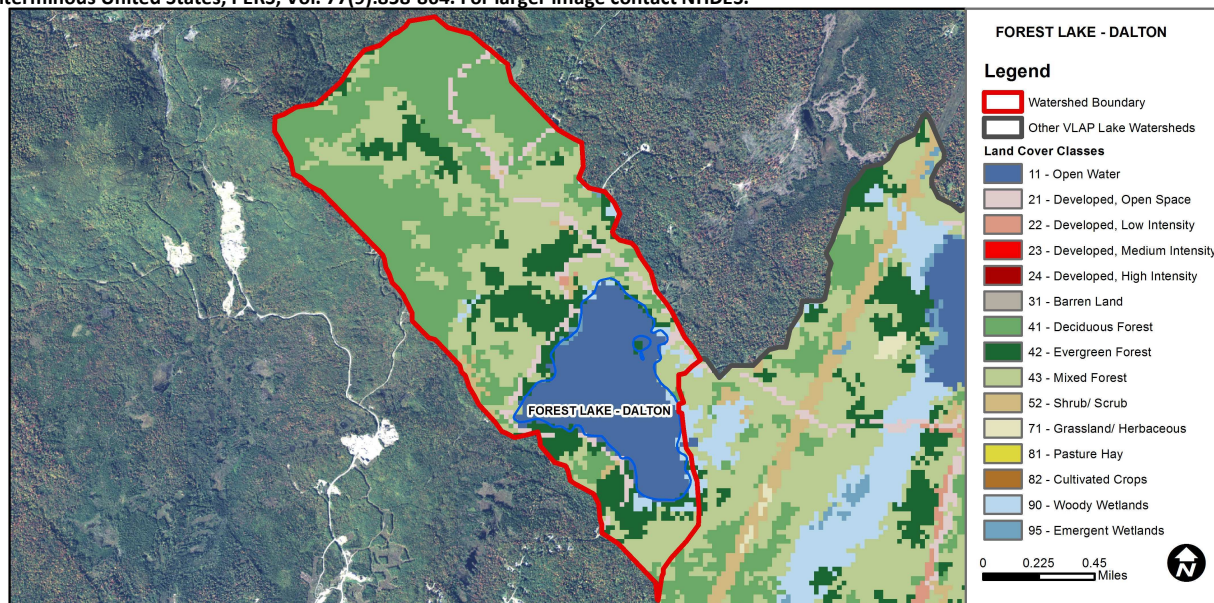
| Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	17.1	Barren Land	0	Grassland/Herbaceous	0
Developed-Open Space	3.91	Deciduous Forest	34.75	Pasture Hay	0
Developed-Low Intensity	0.1	Evergreen Forest	13.03	Cultivated Crops	0
Developed-Medium Intensity	0	Mixed Forest	26.84	Woody Wetlands	1.6
Developed-High Intensity	0	Shrub-Scrub	0.94	Emergent Wetlands	0.23

RECOMMENDED ACTIONS: Lake water quality was good in 2015 and indicative of Oligotrophic, or high quality waters, conditions. The improving chlorophyll and phosphorus trends are encouraging, however lake clarity or transparency has declined. This may be a result of stormwater runoff due to high volume storm events flushing unstable sediments and nutrients into the lake, as well as flushing wetland systems rich in organic acids that cause water to become highly colored and therefore less clear. Conduct Apparent Color analyses on deep spot samples to determine if water color has become darker over time. This can be analyzed free of charge at the DES Jody Connor Limnology Center. State Beach Brook continues to exhibit elevated phosphorus and turbidity which may in part be caused by beaver activity and high levels of organic content due to flooded upstream landscape. Keep up the great work!

OBSERVATIONS (*Refer to Table 1 and Historical Deep Spot Data Graphics*)

- **CHLOROPHYLL-A:** Chlorophyll levels were low in August and much less than the state median. Historical trend analysis indicates significantly decreasing (improving) chlorophyll levels since 1989.
- **CONDUCTIVITY/CHLORIDE:** Deep spot and tributary conductivity levels were low and approximately equal to the state median. Historical trend analysis indicates stable epilimnetic (upper water layer) conductivity since 1989.
- **E. COLI:** Newt, Sundman and Wright Cottage E. coli levels were very low and much less than the state standard for public beaches (88 cts/100 mL) and surface waters (406 cts/100 mL).
- **TOTAL PHOSPHORUS:** Epilimnetic, hypolimnetic (lower water layer), North Inlet, and Outlet phosphorus levels were low. Epilimnetic phosphorus decreased slightly from 2014 and was less than the state median. Historical trend analysis indicates significantly decreasing (improving) epilimnetic phosphorus since 1989. State Beach Brook phosphorus levels were elevated in August and the turbidity was also slightly elevated. This station has a history of elevated and fluctuating phosphorus levels.
- **TRANSPARENCY:** Transparency was good in August, improved (increased) from 2014 and was better than the state median. However, historical trend analysis indicates significantly decreasing (worsening) transparency since monitoring 1989.
- **TURBIDITY:** Epilimnetic, hypolimnetic, North Inlet and Outlet turbidities were low to average. State Beach Brook turbidity was slightly elevated likely due to low flow conditions.
- **pH:** Epilimnetic pH was invalided due to a laboratory meter error. Historical trend analysis indicates highly variable epilimnetic pH since 1990. Hypolimnetic, North Inlet, Outlet and State Beach Brook pH levels were all within the desirable range 6.5-8.0 units.

Dissolved Oxygen & Temperature Profile, August 2015

Forest Lake Algal Population August 2015
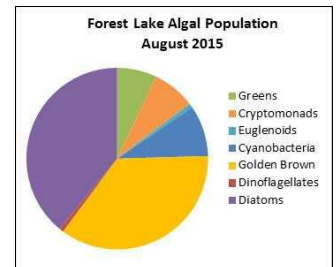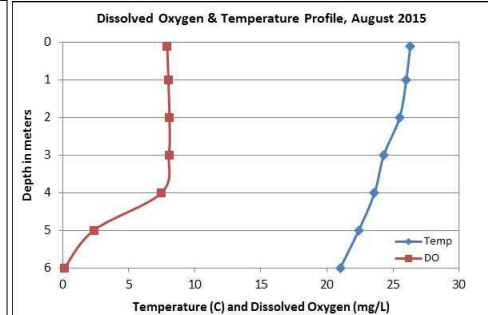
Station Name	Table 1. 2015 Average Water Quality Data for FOREST LAKE								
	Alk. mg/l	Chlor-a ug/l	Cond. uS/cm	E. Coli #/100ml	Total P ug/l	Trans. m		Turb. ntu	pH
						NVS	VS		
Epilimnion	10.4	2.72	36.9		6	4.10	4.35	0.97	
Hypolimnion			36.5		9			1.38	6.72
Newt Cottage				10					
North Inlet			36.9		6			0.76	6.99
Outlet			36.8		7			0.73	7.06
State Beach Brook			44.3		34			3.46	6.59
Sundman Cottage				10					
Wright Cottage				10					

NH Median Values: Median values for specific parameters generated from historic lake monitoring data.

Alkalinity: 4.9 mg/L

Chlorophyll-a: 4.58 mg/m^3

Conductivity: 40.0 uS/cm

Chloride: 4 mg/L

Total Phosphorus: 12 ug/L

Transparency: 3.2 m

pH: 6.6

NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.

Chloride: > 230 mg/L (chronic)

E. coli: > 88 cts/100 mL – public beach

E. coli: > 406 cts/100 mL – surface waters

Turbidity: > 10 NTU above natural level

pH: between 6.5-8.0 (unless naturally occurring)

HISTORICAL WATER QUALITY TREND ANALYSIS

Parameter	Trend	Explanation	Parameter	Trend	Explanation
Conductivity	Stable	Trend not significant; data show low variability.	Chlorophyll-a	Improving	Data significantly decreasing.
pH (epilimnion)	Stable	Trend not significant; data highly variable.	Transparency	Worsening	Data significantly decreasing.
			Phosphorus (epilimnion)	Improving	Data significantly decreasing.

Historical Trend Epilimnetic Conductivity and pH

Historical Deep Spot Chlorophyll-a, Epilimnetic Total Phosphorus & Transparency Data